BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking Regarding Policies, Procedures and Rules for the California Solar Initiative, the Self-Generation Incentive Program and Other Distributed Generation Issues.	)))))	R.06-03-004

DECLARATION OF JOHN BERDNER

I, John Berdner, declare as follows:

1. I am President of SMA America, Inc., U.S. subsidiary of SMA Technologie, AG. My business address is: 12438 Loma Rica Drive, Grass Valley, CA 95945

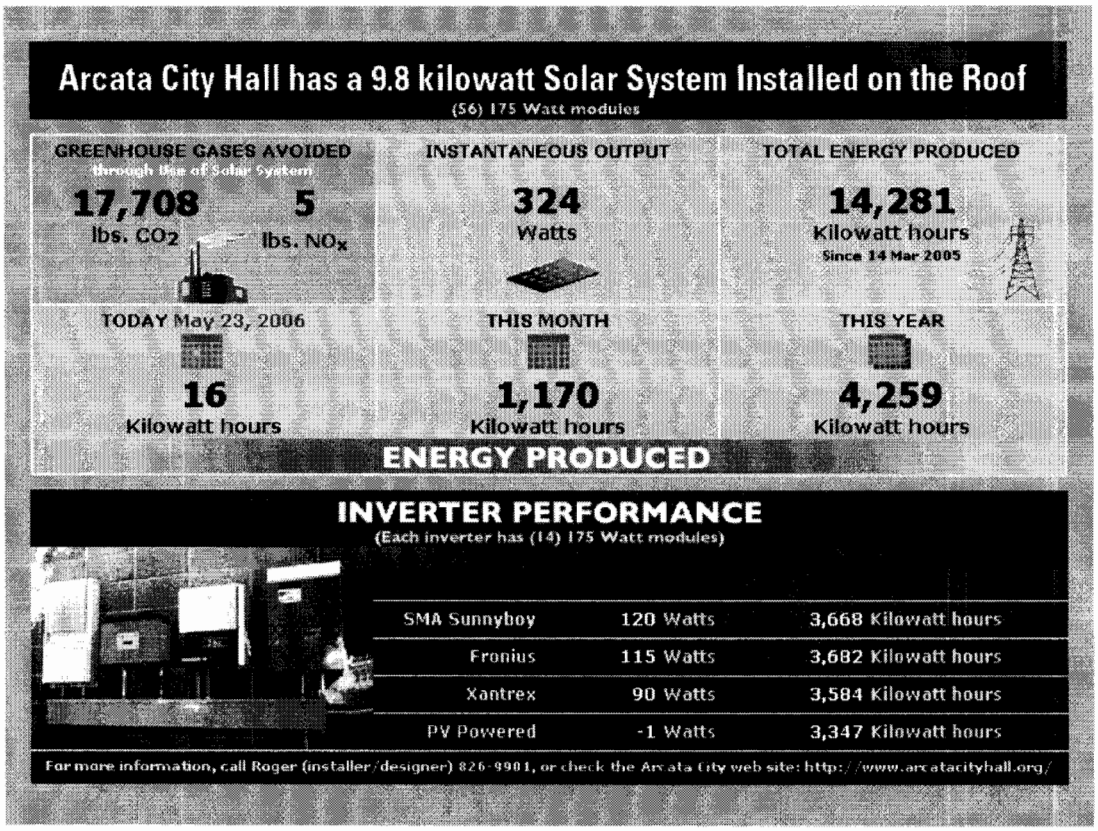
2. SMA Technologie, AG was founded in 1981 and is the oldest and largest supplier of photovoltaic (PV) inverters in the world, with more than 400,000 inverters installed worldwide. SMA has extensive experience in the development of the PV programs in Germany.

3. I have been working in the field of PV system engineering for 23 years. I am a voting member of the Standards Technical panel for Underwriters Laboratory, Inc. (UL) Standard 1741 (the PV inverter safety standard). I am a member of the industry advisory group for National Electric Code (NEC) Article 690 (the portion of the Code addressing PV standards). I am also one of the United States experts for the Institute of Energy Conversion (IEC) PV Task Group.

4. The California Energy Commission's (CEC) inverter and module rating is not an appropriate benchmark for determining system output for purposes of calculating PV incentive payments. The CEC testing model does not address accuracy of inverter power tacking and other aspects of inverter operation. In addition, there are numerous external factors, including verified module rating, wire size, and installation practices, that are not included in the CEC calculation. These other factors cumulatively can have a greater impact on system output than CEC weighted inverter efficiency.

5. The Arcata City Hall provides a real world example of the inaccuracy of the CEC AC rating system. The system consists of four matched solar arrays with inverters from four different manufacturers. The installation practices were identical but verification

tests have shown that the actual energy production varies by approximately 10%. The large variance in energy production is inconsistent with results predicted using CEC inverter efficiency ratings. The CEC efficiency ratings of the four inverters displayed, from top to bottom, are: Sunny Boy 92.5%, Fronius 93%, Xantrex 94.5%, and PV Powered 94%. The actual energy yield as of May 23, 2006, shown in the screen capture below, shows significantly lower energy production for most highly rated inverters and significantly higher production from lower rated inverters.



5. The "system" AC approach proposed by the California Public Utilities Commission Staff for the proposed "Expected Performance" Buydown Incentive does *not* address the accuracy and verification problems we have observed in the CEC AC inverter rating, and has the additional problem of being untested and requiring verification. In my opinion, the use of AC rating will complicate the application process by requiring complicated calculations. The additional information required for array orientation and shading will require a verification process that apparently has not yet been developed.

6. It appears from the limited information provided that the proposed verification process would also require extensive testing and on-site visits. The on-site verification process would be random in nature and therefore inherently inefficient at detecting underperforming systems. In addition, on site verification would require the creation of additional bureaucracy that will divert budget and resources away from installations.

7. A simple performance-based incentive (PBI) would be vastly superior to the inaccurate ratings currently used by the CEC and proposed by the CPUC. Rebates based on output meters are inherently preferable to rating approaches, which rely on proxies for prediction and verification. PBI based programs intrinsically provide proper market drivers encompassing all of the many variables found in PV system design and installation. Over time, market forces then act to reward high performance installation and system design and penalize underperforming systems. Public dissemination of comparative performance data would create informed consumers, thereby accelerating the corrective action of market forces.

8. With a simple PBI payment based on metered output of system performance. The CPUC will not need a complicated on-site verification system as web-based monitoring solutions are available today from multiple vendors. These web-based solutions will provide accurate verification at low initial cost and little or no recurring costs.

9. Basically, it is my observation, based on my years of experience and knowledge of the market, that basing payments for PV incentives on AC inverter ratings is and will always be problematic. Using easily verifiable, accurate and reliable metered output for calculating performance-based incentives is preferable for all of the reasons I have discussed above.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on May 24, 2006, at Grass Valley, CA.

By: